

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
14 October 2004 (14.10.2004)

PCT

(10) International Publication Number  
WO 2004/087194 A3

(51) International Patent Classification<sup>7</sup>: A61K 38/17, (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number: PCT/EP2004/003417

(22) International Filing Date: 31 March 2004 (31.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 03007274.8 31 March 2003 (31.03.2003) EP

(71) Applicant (for all designated States except US): DEVEL-  
OGEN AKTIENGESELLSCHAFT FÜR ENTWICK-  
LUNGSBIOLOGISCHE FORSCHUNG [DE/DE];  
Rudolf-Wissell-Strasse 28, 37079 Göttingen (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ONICHTCHOUK,  
Daria [RU/DE]; Auf der Lieth 12, 37077 Göttingen (DE).  
NGUYEN, Tri [US/DE]; Helmholtzstrasse 15, 37081 Göttingen (DE).

(74) Agent: KAISER, Jürgen; Winter Brandl Fürniss Hübner  
Röss Kaiser Polte - Partnership, Alois-Steinecker-Strasse  
22, 85354 Freising (DE).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:  
24 February 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/087194 A3

(54) Title: USE OF A DG931 PROTEIN FOR TREATING DIABETES, OBESITY AND METABOLIC SYNDROME

(57) Abstract: The present invention discloses proteins secreted by the developing pancreas, and polynucleotides, which identify and encode these proteins. The invention also relates to the use of these sequences in the diagnosis, study, prevention, and treatment of metabolic diseases and disorders.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/003417

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 A61K38/17 A61P3/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61K A61P		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ, Sequence Search, BIOSIS, EMBASE		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/21651 A (LEXICON GENETICS INC) 29 March 2001 (2001-03-29) cited in the application page 1 - page 5 page 10, line 17 - page 12, line 30 page 13, line 16 - line 22 -----	16-21, 31, 32
X	WO 02/22802 A (GLAXO GROUP LTD ; SMITHKLINE BEECHAM PLC (GB); SMITHKLINE BEECHAM CORP) 21 March 2002 (2002-03-21) cited in the application pages 24,36 page 109 - page 111 page 211 - page 212 ----- -/-	1-14,16, 19-21,32
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		<input checked="" type="checkbox"/> Patent family members are listed in annex.
° Special categories of cited documents :		
*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed		
*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the International search report
22 October 2004		26/11/2004
Name and mailing address of the ISA		Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Hars, J

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/003417

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/016475 A (BAYER AG ; D URSO DONATELLA (DE); BEFORT KATIA (FR); GEN HOSPITAL CORP) 27 February 2003 (2003-02-27) table 2 claim 20 -----	1-14,32
X	US 2003/059768 A1 (SPADERNA STEVEN K ET AL) 27 March 2003 (2003-03-27) cited in the application tables 1,32,34 paragraphs '0298!, '0302!, '0303!; claims 20,21 -----	16,21
X	DATABASE UNIPROT EMBL/EBI; Hypothetical protein DKFZp434B044 1 March 2001 (2001-03-01), EMBL-EBI: "Q9H0B8" XP002302273 retrieved from WWW.EBI.AC.UK accession no. Q9H0B8 Database accession no. Q9H0B8 abstract -----	19,20,32

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 22-26; 1-21,27-32 (partially)

Present claims 1-32 relate to a products, compounds, methods, etc. defined by reference to a desirable characteristic or property, namely:

- a) "functional fragment", "isoform", "variant", "homologue" of DG931
- b) "effector / modulator" of DG931
- c) "a medicament for the controlling the function of a gene and/or a gene product which is influenced and/or modified by a DG931 polypeptide"
- d) a screening method based on "a binding target/agent of DG931 polypeptide"
- e) a screening method based on an "(reference) activity of DG931"
- f) compositions identified through the screening methods

The claims cover all products, compounds, methods, etc. having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such products, compounds, methods, etc.. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the products, compounds, methods, etc. by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the products, compounds, methods, etc.

- a) full length DG931 only
- b) antibodies, aptamers
- c) the diseases enumerated eg in claim 27
- d) none - no such binding agent is known (reach-through claims)
- e) none - no activity of DG931 is known (reach-through claims)
- f) none - no such composition has been identified (reach-through claims)

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

overcome.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2004/003417

### Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: 22-26; 1-21, 27-32 (partially)  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/EP2004/003417

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 0121651	A	29-03-2001		AU 7831100 A CA 2386767 A1 JP 2003528581 T WO 0121651 A2		24-04-2001 29-03-2001 30-09-2003 29-03-2001
WO 0222802	A	21-03-2002		AU 9261901 A BR 0113820 A CA 2421303 A1 CN 1474869 T CZ 20030722 A3 EP 1317538 A1 HU 0400016 A2 IL 154725 A JP 2004508825 T NO 20031141 A NZ 524328 A WO 0222802 A1		26-03-2002 24-06-2003 21-03-2002 11-02-2004 17-03-2004 11-06-2003 28-04-2004 23-12-2003 25-03-2004 09-05-2003 24-09-2004 21-03-2002
WO 03016475	A	27-02-2003		CA 2457819 A1 WO 03016475 A2		27-02-2003 27-02-2003
US 2003059768	A1	27-03-2003		AU 3988901 A WO 0162928 A2		03-09-2001 30-08-2001